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# **Evaluating Input Oriented Technical Efficiency in the Indian Machinery Sector: Insights from the Post-Reform Era**

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**Abstract :** This study evaluates the Input-Oriented Technical Efficiency (ITE) of the Indian machinery sector during the post-reform period, utilizing a Non-parametric Data Envelopment Analysis (DEA) based on firm-level data from the CMIE Prowess Database, spanning March 1995 to March 2016. The findings reveal a decline in average ITE from 0.895 to 0.854 over the period. The highest average ITE (0.936) occurred in 1998, while the lowest (0.854) was in 2016. Only around 17% of the sampled firms were operating efficiently. The results indicate that these firms could have maintained the same output level while reducing raw material inputs by 43.77%, energy and water usage by 13.639%, labour by 31.647%, land by 2.843% and capital by 85.947%. A panel regression was conducted to explore the relationship between ITE and factors such as advertising intensity (ADV), marketing intensity (MKT), R&D intensity (RD), and net exports intensity (NX). The analysis suggests that increases in ADV, MKT, RD, and NX improve firm performance (i.e., ITE), and ITE, in turn, significantly influences these strategic variables in the Indian machinery industry. The study also proposes policy recommendations to enhance ITE in this sector.

**Keywords:** Manufacturing Sector, Indian Economy, Data Envelopment Analysis

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